Title: Play Day Design

Brief Overview:

In this performance assessment the students will help design the layout and activities for a Play Day at their school. They will integrate skills in geometry, spatial analysis, measurement, and communication to achieve this goal.

Links to Standards:

- **Mathematics as Problem Solving**
  Students will demonstrate their ability to solve problems in mathematics including problems with open ended answers.

- **Mathematics as Communication**
  Students will demonstrate their ability to communicate mathematically. They will read, write, and discuss mathematics with language and the signs, symbols, and terms of the discipline.

- **Mathematics as Reasoning**
  Students will demonstrate their ability to reason mathematically. They will make conjectures and build arguments.

- **Mathematical Connections**
  Students will demonstrate their ability to connect mathematics topics within the discipline and with other disciplines.

- **Geometry and Spatial Sense**
  Students will demonstrate their ability to apply geometric concepts to the solution of problems.

- **Measurement**
  Students will demonstrate their ability to apply concepts of measurement using standard units. They will apply measurement to interdisciplinary and real-world problem solving situations.

Grade/Level:

Grades 3-4

Duration/Length:

This task takes approximately four one hour sessions.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Computing area and perimeter
- Writing a letter to persuade

Objectives:

Students will:

- compute and label the area and perimeter of regular polygons.
- work cooperatively in groups
- identify possible solutions for a real-life problem
- write a letter to persuade

Materials/Resources/Printed Materials:

- Student Activity Packet consisting of:
  - Brainstorming Organizer
  - Centimeter Grid
  - Perimeter and Area Responses
  - Letter Template
  - Student Checklist
- Games Station Pattern
- Perimeter and Area Responses Answer Key
- Colored Pencils
- Scissors

Development/Procedures:

Activity 1:

The teacher will:

- read the introductory vignette at the top of Activity Sheet #1, Brainstorming Organizer.

The students will:

- brainstorm, in groups of three or four, different games to be used during Play Day.
- record the results of their brainstorming in the spaces provided on the Brainstorming Organizer.
- share the results of the Brainstorming Organizer with the class, filling in blanks and/or borrowing other ideas.

- independently select five games to incorporate into their design.
- circle their selections on the Brainstorming Organizer.

Skills Developed:

- Brainstorming, accurate record keeping, cooperative learning skills, following directions

Activity 2:

The teacher will:

- read the directions on Activity Sheet #2, Centimeter Grid.
- distribute Games Station Pattern.

The students will:

- color and cut the shapes from the Games Station Pattern which will be handed out separately.
- arrange and trace the shapes on the Centimeter Grid.
- label each shape with one of the five selected games from the Brainstorming Organizer.

Skills Developed:

- Following directions, visual organization, labeling

Activity 3:

The teacher will:

- direct the students to independently complete Activity Sheet #3, Area and Perimeter Responses.

The students will:

- read the directions on Area and Perimeter Responses.
- find the area and perimeter of each shape.

Skills Developed:

- Reading and following directions, figuring are and perimeter

Activity 4:

The teacher will:

- read the directions on Activity Sheet #4, Letter Template.

The students will:

- write a letter to persuade.

Skills Developed:

- Persuasive letter writing skills

Activity 5:

The teacher will:

- direct the students to independently complete Activity Sheet #5, Student Checklist.

The students will:

- read the directions on the Student Checklist.
- complete the checklist.

Skills Developed:

- Reading and following directions, self-monitoring achievement

Performance Assessment:

Teachers may use observations, anecdotal records, and the student checklist to assess students as they complete the activities outlined in the task.

Extension/Follow Up:

Students may:

- design their own Game Station patterns.
- use pre-cut Game Station patterns.
- chose a name for their station and explain why they chose it.
- create a sign for their station that would make it especially attractive to other students.
- record a set of directions for one of their games.
- use outside resources, i.e. the Internet, parents, media center, etc., to discover new games to share.

- record their results on video or tape recorders.
- work with partners to develop a Game Station.
- measure perimeter and/or area of playground, blacktops, jungle gym space, etc.

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BRAINSTORMING ORGANIZER (Student Resource 1)

Play Day is coming soon! We have been asked by the principal to think of some fun games. You will then create a design to show how those games will be set up on the playground.

Step One:

Work with your group to list as many possible Play Day activities as you can. You will have ten minutes to complete Step One.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

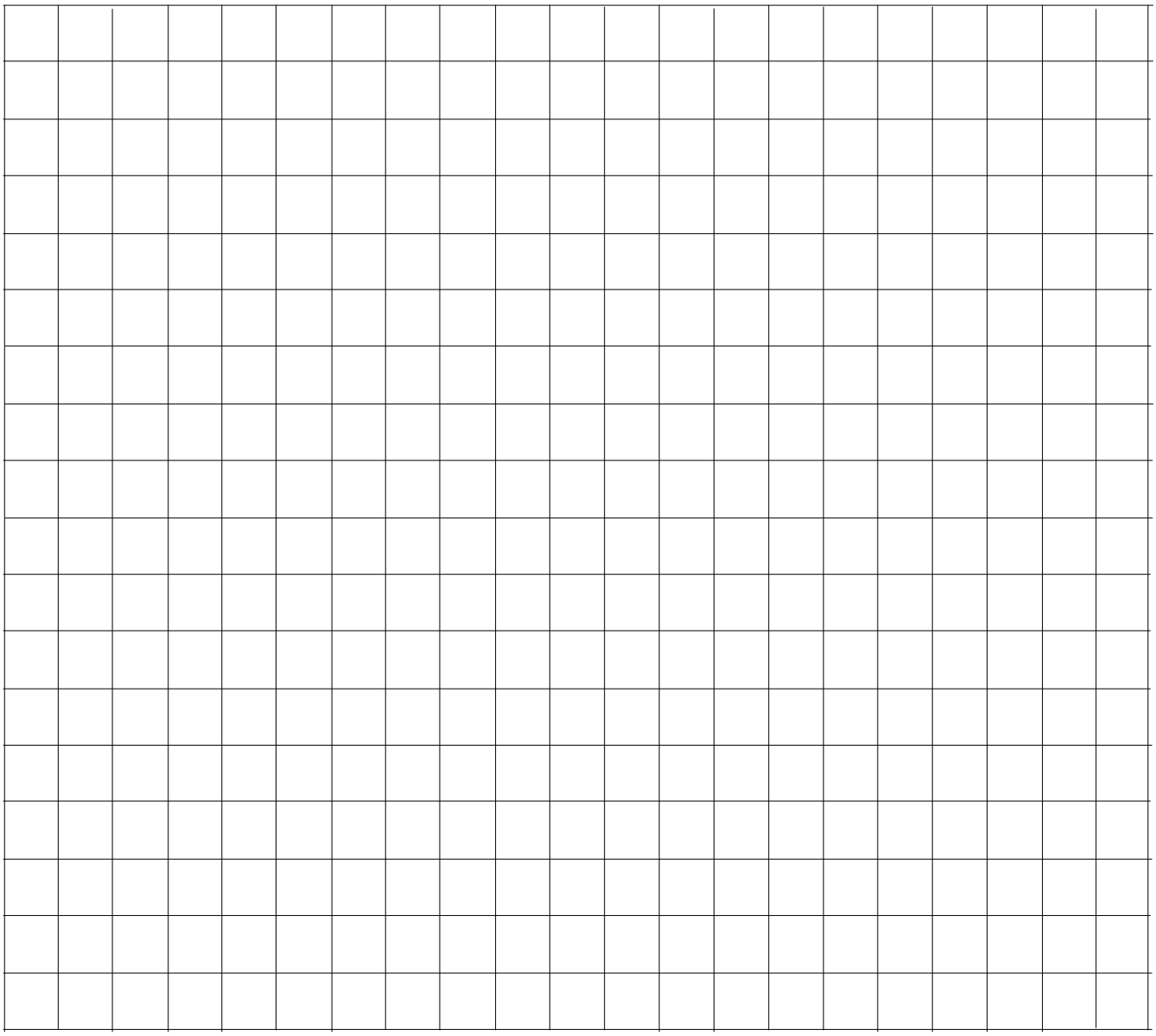
Step Two:

Circle five of the activities that you have written above. Choose the games that you like the best or think would be the most fun.

CENTIMETER GRID (Student Resource 2)

You need to decide where each game will be set up. First, color the shapes on the Games Station Pattern. Next, cut each shape. Now arrange the shapes on the centimeter grid. Remember to leave space between each game area for students to get to each game. When you have chosen your design, trace each shape. Decide which shape would be best for each game you have chosen. Finally, write the name of the game and the number of the pattern on the shape you have traced on the grid.

One side of each square is equal to one meter.



AREA AND PERIMETER RESPONSES (Student Resource 3)

Step One:

Find the area of each shape and write your answers below. Make sure the numbers on the shapes match the numbers below.

1._____

2._____

3._____

4._____

5._____

Step Two:

Find the perimeter of each shape and write your answers below. Make sure the numbers on the shapes match the numbers below.

Work Space

1._____

2._____

3._____

4._____

5._____

Step Three:

You decide to separate each game by putting rope around the activity. Which game will need the most rope?

_____

Write at least one sentence to tell how you knew which game needed the most rope.

_____

_____

_____

AREA AND PERIMETER RESPONSES CONTINUED (Student Resource 3)

Step Four:

Explain how to find area and perimeter using one of your shapes as an example.

_____

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What is the difference between area and perimeter?

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LETTER TEMPLATE (Student Resource 4)

Now you need to write a letter to persuade the principal that your Play Day design is the best. Your letter should include reasons why your design is best, why other students will want to play the games you have chosen, and any other information you used to plan your design. You may want to use a graphic organizer and write a rough draft before writing your final copy. Your teacher will only be looking at your final copy so be sure to use your best handwriting, spelling, punctuation, and grammar.

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_____,

_____,

STUDENT CHECKLIST (Student Resource 5)

Put a check next to each sentence if you have completed each activity as directed. You may want to look at each section to make sure.

Brainstorming Organizer

_____I circled five games.

Centimeter Grid

_____I colored the shapes from the Games Station Pattern.

_____I cut the shapes from the Games Station Pattern.

_____I arranged the shapes on the Centimeter Grid.

_____I traced the shapes on the Centimeter Grid.

_____I labeled each shape.

Area and Perimeter Responses

_____I found the area of all five shapes.

_____I found the perimeter of all five shapes.

_____I labeled my answers.

_____I explained which shape would need the most rope.

Letter Template

_____I included reasons why my design is best.

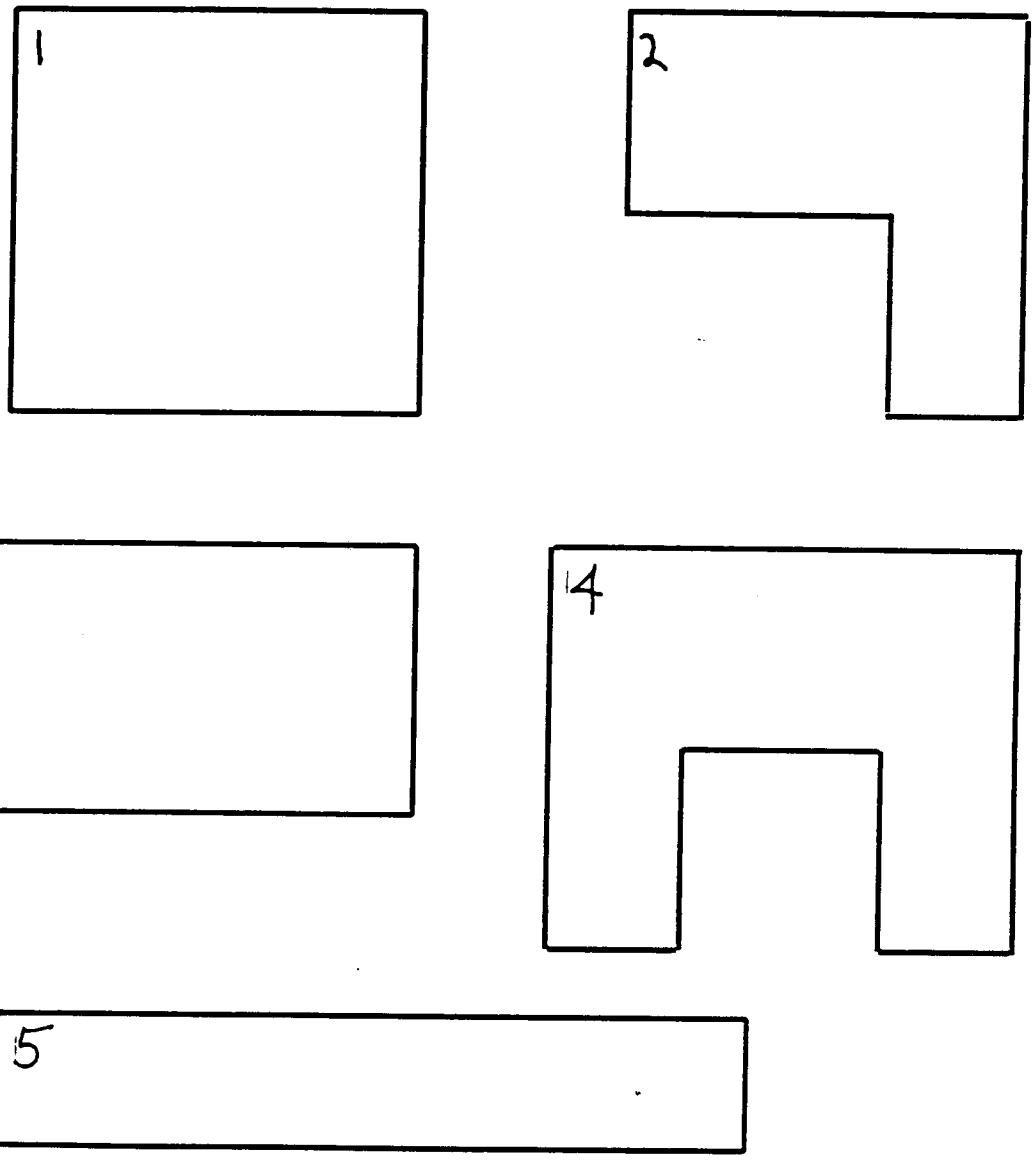
_____I explained why others will want to play my games.

_____I used by best writing skills.

Student Checklist

_____I completed the Student Checklist.

GAMES STATION PATTERN (Teacher Resource 1)



PERIMETER AND AREA RESPONSES ANSWER KEY (Teacher Resource 2)

Step One (Area):
1. 36 square meters
2. 24 square meters
3. 28 square meters
4. 33 square meters
5. 22 square meters

Step Two (Perimeter):
1. 24 meters
2. 24 meters
3. 22 meters
4. 32 meters
5. 26 meters

Step Three:
While the name of the game will vary, shape number four will require the longest piece of rope because this shape has the largest perimeter.

Step Four:
Any logical response is acceptable.